

# **APPENDIX D**



## TECHNICAL REPORT

**Report To:** Mr. David E. King, RG, LHG, REA  
Kleinfelder  
15050 SW Knoll Parkway Suite L  
Beverton, Oregon 97006

**Date:** 8/8/07

**Lab No:** 07-266

**Project:** Laboratory Testing – 53886/5

**Project No.:** 1643.1.1

**Report of:** Sieve analysis and hydrometer analysis of soil test results

### Sample Identification

NTI determined the sieve analysis and hydrometer analysis on soil samples delivered to our laboratory on July 20, 2007. Testing was performed in accordance with the standards indicated. Our laboratory test results are summarized on the following tables and attached pages.

### Laboratory Testing

**Sample Id:** MC

Sieve Analysis of Aggregate (ASTM C136/ C117)	
Sieve Size	Percent Passing
1/4"	100
#4	100
#8	99
#10	99
#16	98
#30	97
#40	97
#50	97
#100	94
#120	93
#200	89.2
#230	89.4

**Copies:** Addressee

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SHEET 1 of 14

REVIEWED BY: Bridgett Adame



# TECHNICAL REPORT

**Report To:** Mr. David E. King, RG, LHG, REA  
Kleinfelder  
15050 SW Knoll Parkway Suite L  
Beverton, Oregon 97006

**Date:** 8/8/07

**Lab No:** 07-266

**Project:** Laboratory Testing – 53886/5

**Project No.:** 1643.1.1

## Laboratory Testing

**Sample Id: BC**

Sieve Analysis of Aggregate (ASTM C136/ C117)	
Sieve Size	Percent Passing
1/4"	100
#4	99
#8	98
#10	97
#16	94
#30	89
#40	87
#50	82
#100	60
#120	59
#200	45.7
#230	43.9

**Sample Id: LBC**

Sieve Analysis of Aggregate (ASTM C136/ C117)	
Sieve Size	Percent Passing
1/4"	100
#4	99
#8	99
#10	99
#16	98
#30	95
#40	91
#50	82
#100	65
#120	61
#200	53.0
#230	49.7

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SHEET 2 of 14

REVIEWED BY: Bridgett Adame



# TECHNICAL REPORT

**Report To:** Mr. David E. King, RG, LHG, REA  
Kleinfelder  
15050 SW Knoll Parkway Suite L  
Beverton, Oregon 97006

**Date:** 8/8/07

**Lab No:** 07-266

**Project:** Laboratory Testing – 53886/5

**Project No.:** 1643.1.1

## Laboratory Testing

**Sample Id: SP1**

Sieve Analysis of Aggregate (ASTM C136/ C117)	
Sieve Size	Percent Passing
1/4"	100
#4	100
#8	100
#10	100
#16	98
#30	95
#40	94
#50	90
#100	65
#120	56
#200	20.4
#230	14.7

**Sample Id: SP2**

Sieve Analysis of Aggregate (ASTM C136/ C117)	
Sieve Size	Percent Passing
1/4"	100
#4	100
#8	98
#10	97
#16	93
#30	88
#40	85
#50	82
#100	74
#120	65
#200	59.2
#230	52.7

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SHEET 3 of 14

REVIEWED BY: Bridgett Adame



# TECHNICAL REPORT

**Report To:** Mr. David E. King, RG, LHG, REA  
Kleinfelder  
15050 SW Knoll Parkway Suite L  
Beverton, Oregon 97006

**Date:** 8/8/07

**Lab No:** 07-266

**Project:** Laboratory Testing – 53886/5

**Project No.:** 1643.1.1

## Laboratory Testing

**Sample Id: SP3**

Sieve Analysis of Aggregate (ASTM C136/ C117)	
Sieve Size	Percent Passing
1/4"	100
#4	100
#8	100
#10	100
#16	98
#30	94
#40	78
#50	61
#100	40
#120	35
#200	23.3
#230	20.7

**Sample Id: SP4**

Sieve Analysis of Aggregate (ASTM C136/ C117)	
Sieve Size	Percent Passing
3/4"	100
1/2"	71
3/8"	61
1/4"	55
#4	49
#8	42
#10	40
#16	37
#30	27
#40	18
#50	12
#100	6
#120	5
#200	3.0
#230	2.5

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SHEET 4 of 14

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TECHNICAL REPORT

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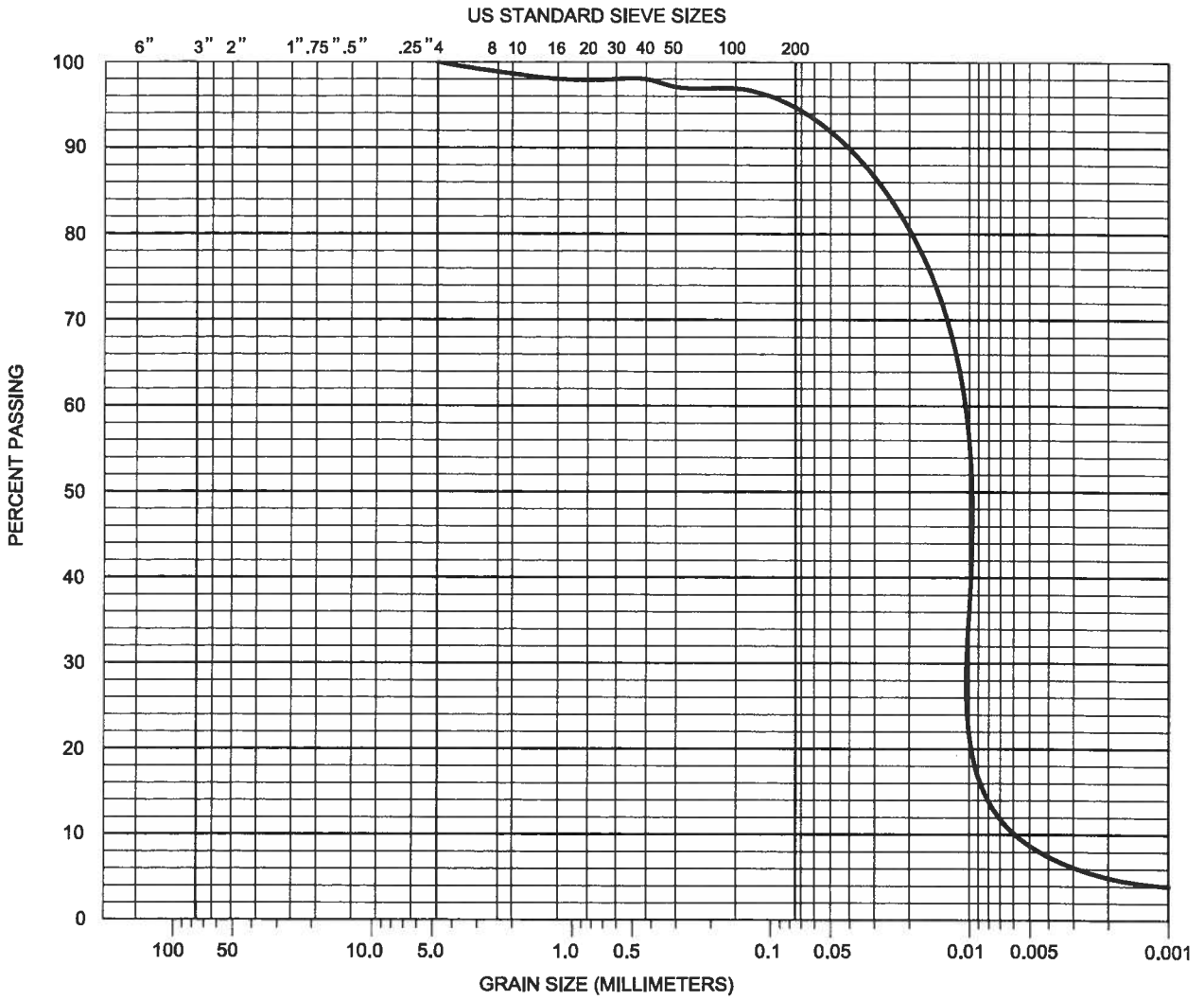
<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	SP5		

Weight Retained on the #10	1.88	1.20	Tare	13.57	g
Weight Passing the #10	157.48	98.80	Wet Weight + Tare	50.23	g
Total Wet Sample Weight	159.36		Dry Weight + Tare	49.51	g
Total Dry Sample Weight	156.23		Moisture Content	2.00	%

<b>Hydrometer</b>					
Air Dry Weight of Sample Used	66.45		Specific Gravity (assumed)	2.60	
Dry Weight of Sample Used	65.14	g	Specific Gravity Correction Factor	1.01	
Dry Weight Represented (W)	65.94	g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, F (%Soil Finer)
2	61	6	55	72	22	7.3	0.01337	0.025500	84.2
5	50	6	44	72	22	9.1	0.01337	0.018016	67.4
15	33	6	27	72	22	11.9	0.01337	0.011892	41.4
30	24	6	18	72	22	13.3	0.01337	0.008917	27.6
60	13	6	7	72	22	15.1	0.01337	0.006718	10.7
275	12	6	6	72	22	15.3	0.01337	0.003155	9.2
1440	9	6	3	72	22	15.8	0.01337	0.001401	4.6

<b>Sieve Analysis of Fine Aggregate</b>				
Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0	0.00	100
#4	4.75	0.05	0.03	100
#8	2.36	1.51	0.97	99
#10	2.00	1.88	1.20	99
#16	1.18	0.30	0.45	98
#30	0.60	0.48	0.73	98
#40	0.43	0.63	0.96	98
#50	0.30	0.90	1.36	97
#100	0.15	1.40	2.12	97
#200	0.075	2.45	3.72	95
pan		2.64	4.00	95



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	SAMPLE LOCATION	FIELD MOISTURE (%)	% PASSING NO. 200 SIEVE	% PASSING 2 μ	UNIFIED SOIL CLASSIFICATION
	SP5	—	95.0	5	—

## GRADATION TEST RESULTS

PROJECT NO. 1643.1.1	KLEINFELDER LABORATORY TESTING	LAB NO. 07-266
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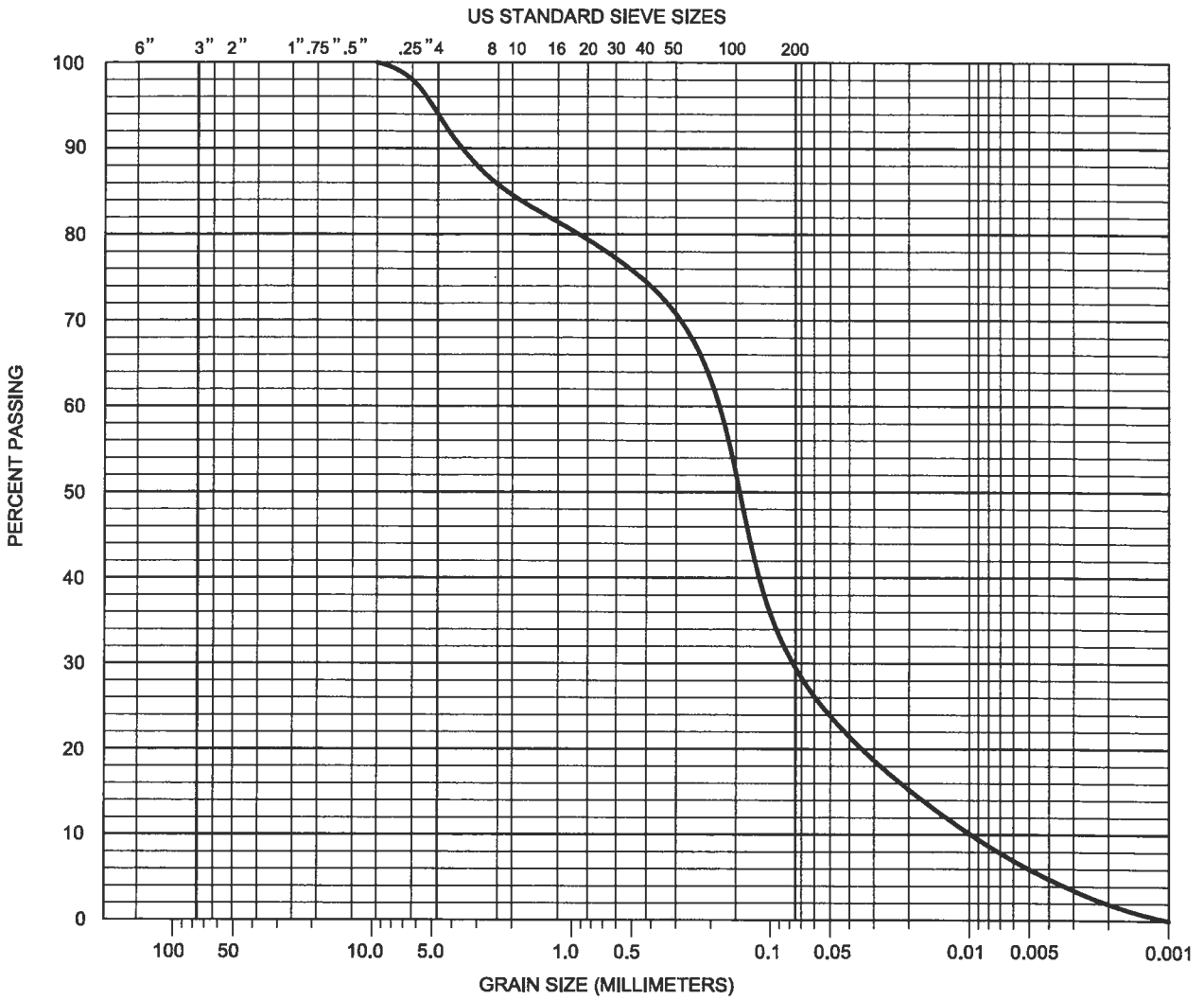
<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	LWS		

Weight Retained on the #10	34.74	15.58	Tare	14.74	g
Weight Passing the #10	198.74	84.42	Wet Weight + Tare	63.38	g
Total Wet Sample Weight	233.48		Dry Weight + Tare	61.18	g
Total Dry Sample Weight	222.92		Moisture Content	4.74	%

<b>Hydrometer</b>					
Air Dry Weight of Sample Used	64.97		Specific Gravity (assumed)	2.60	
Dry Weight of Sample Used	62.03	g	Specific Gravity Correction Factor	1.01	
Dry Weight Represented (W)	73.48	g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, F (%Soil Finer)
2	20	6	14	72	22	14.0	0.01337	0.035372	19.2
5	18	6	12	72	22	14.3	0.01337	0.022632	16.5
15	14	6	8	72	22	15.0	0.01337	0.013362	11.0
30	12	6	6	72	22	15.3	0.01337	0.009552	8.2
60	11	6	5	72	22	15.5	0.01337	0.006790	6.9
275	9	6	3	72	22	15.8	0.01337	0.003205	4.1
1440	7	6	1	72	22	16.1	0.01337	0.001415	1.4

<b>Sieve Analysis of Fine Aggregate</b>				
Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	5.48	2.46	98
#4	4.75	12.75	5.72	94
#8	2.36	31.03	13.92	86
#10	2.00	34.74	15.58	84
#16	1.18	2.70	3.67	81
#30	0.60	5.06	6.89	78
#40	0.43	6.72	9.14	75
#50	0.30	9.93	13.51	71
#100	0.15	24.11	32.81	52
#200	0.075	39.70	54.03	30
pan		41.56	56.56	28



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	SAMPLE LOCATION	FIELD MOISTURE (%)	% PASSING NO. 200 SIEVE	% PASSING 2 μ	UNIFIED SOIL CLASSIFICATION
	LWS	—	30.0	2	—

## GRADATION TEST RESULTS

PROJECT NO. 1643.1.1	KLEINFELDER LABORATORY TESTING	LAB NO. 07-266
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<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	WR		

Weight Retained on the #10	0.15	0.10	Tare	13.57	g
Weight Passing the #10	151.98	99.90	Wet Weight + Tare	43.11	g
Total Wet Sample Weight	152.13		Dry Weight + Tare	41.59	g
Total Dry Sample Weight	144.30		Moisture Content	5.42	%

<b>Hydrometer</b>					
Air Dry Weight of Sample Used	57.16		Specific Gravity (assumed)	2.60	
Dry Weight of Sample Used	54.22	g	Specific Gravity Correction Factor	1.01	
Dry Weight Represented (W)	54.28	g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, F (%Soil Finer)
2	27	6	21	72	22	12.9	0.01337	0.033891	39.1
5	20	6	14	72	22	14.0	0.01337	0.022371	26.1
15	17	6	11	72	22	14.5	0.01337	0.013141	20.5
30	15	6	9	72	22	14.8	0.01337	0.009397	16.7
60	14	6	8	72	22	15.0	0.01337	0.006681	14.9
275	11	6	5	72	22	15.5	0.01337	0.003172	9.3
1440	9	6	3	72	22	15.8	0.01337	0.001401	5.6

<b>Sieve Analysis of Fine Aggregate</b>				
Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0	0.00	100
#4	4.75	0	0.00	100
#8	2.36	0.03	0.02	100
#10	2.00	0.15	0.10	100
#16	1.18	0.22	0.41	99
#30	0.60	0.77	1.42	98
#40	0.43	1.28	2.36	98
#50	0.30	1.81	3.33	97
#100	0.15	4.60	8.48	91
#200	0.075	17.39	32.04	68
pan		21.41	39.45	60



<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	NW1		

Weight Retained on the #10	0.21	0.15	Tare	13.41	g
Weight Passing the #10	141.97	99.85	Wet Weight + Tare	50.84	g
Total Wet Sample Weight	142.18		Dry Weight + Tare	49.76	g
Total Dry Sample Weight	138.08		Moisture Content	2.97	%

<b>Hydrometer</b>					
Air Dry Weight of Sample Used	65.03		Specific Gravity (assumed)	2.60	
Dry Weight of Sample Used	63.15	g	Specific Gravity Correction Factor	1.01	
Dry Weight Represented (W)	63.25	g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, P (%Soil Finer)
2	50	6	44	72	22	9.1	0.01337	0.028486	70.3
5	36	6	30	72	22	11.4	0.01337	0.020166	47.9
15	26	6	20	72	22	13.0	0.01337	0.012454	31.9
30	20	6	14	72	22	14.0	0.01337	0.009133	22.4
60	17	6	11	72	22	14.5	0.01337	0.006571	17.6
275	14	6	8	72	22	15.0	0.01337	0.003121	12.8
1440	9	6	3	72	22	15.8	0.01337	0.001401	4.8

Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0	0.00	100
#4	4.75	0	0.00	100
#8	2.36	0.02	0.01	100
#10	2.00	0.21	0.15	100
#16	1.18	0.11	0.17	100
#30	0.60	0.46	0.73	99
#40	0.43	0.67	1.06	99
#50	0.30	0.80	1.26	99
#100	0.15	1.10	1.74	98
#200	0.075	3.22	5.09	95
pan		4.32	6.83	93





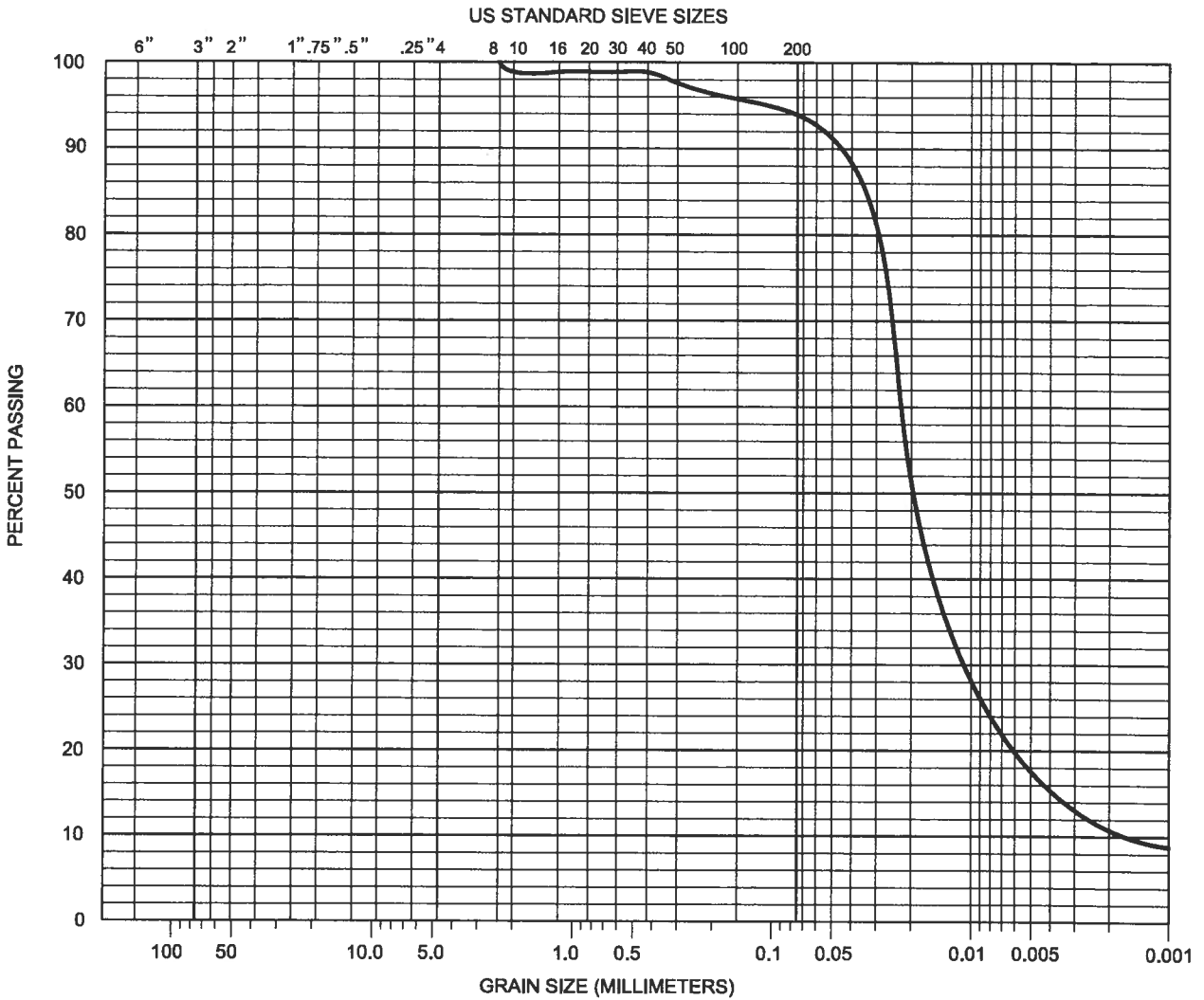
<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	NW2		

Weight Retained on the #10	0.7	0.62	Tare	13.43	g
Weight Passing the #10	114.45	99.38	Wet Weight + Tare	44.17	g
Total Wet Sample Weight	115.15		Dry Weight + Tare	43.35	g
Total Dry Sample Weight	112.08		Moisture Content	2.74	%

<b>Hydrometer</b>					
Air Dry Weight of Sample Used	53.94		Specific Gravity (assumed)	2.60	
Dry Weight of Sample Used	52.50	g	Specific Gravity Correction Factor	1.01	
Dry Weight Represented (W)	52.83	g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, F (%Soil Finer)
2	44	6	38	72	22	10.1	0.01337	0.029990	72.6
5	34	6	28	72	22	11.7	0.01337	0.020455	53.5
15	25	6	19	72	22	13.2	0.01337	0.012532	36.3
30	21	6	15	72	22	13.8	0.01337	0.009079	28.7
60	18	6	12	72	22	14.3	0.01337	0.006533	22.9
275	13	6	7	72	22	15.1	0.01337	0.003138	13.4
1440	11	6	5	72	22	15.5	0.01337	0.001386	9.6

<b>Sieve Analysis of Fine Aggregate</b>				
Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0.1	0.09	100
#4	4.75	0.1	0.09	100
#8	2.36	0.4	0.36	100
#10	2.00	0.7	0.62	99
#16	1.18	0.05	0.09	99
#30	0.60	0.27	0.51	99
#40	0.43	0.42	0.79	99
#50	0.30	0.57	1.08	98
#100	0.15	0.93	1.76	98
#200	0.075	2.64	5.00	94
pan		5.14	9.73	90



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	SAMPLE LOCATION	FIELD MOISTURE (%)	% PASSING NO. 200 SIEVE	% PASSING 2 μ	UNIFIED SOIL CLASSIFICATION
	NW2	-	94.0	11	-

## GRADATION TEST RESULTS

PROJECT NO. 1643.1.1

KLEINFELDER  
LABORATORY TESTING

LAB NO. 07-266



<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	NW3		

Weight Retained on the #10	0.07	0.05	Tare	13.40	g
Weight Passing the #10	151.26	99.95	Wet Weight + Tare	53.15	g
Total Wet Sample Weight	151.33		Dry Weight + Tare	52.30	g
Total Dry Sample Weight	148.09		Moisture Content	2.19	%

<b>Hydrometer</b>					
Air Dry Weight of Sample Used	65.02		Specific Gravity (assumed)	2.60	
Dry Weight of Sample Used	63.63	g	Specific Gravity Correction Factor	1.01	
Dry Weight Represented (W)	63.66	g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, P (%Soil Finer)
2	31	7	24	72	22	12.4	0.01337	0.033236	38.1
5	23	6	17	72	22	13.5	0.01337	0.021975	27.0
15	20	6	14	72	22	14.0	0.01337	0.012916	22.2
30	15	6	9	72	22	14.8	0.01337	0.009397	14.3
60	13	6	7	72	22	15.1	0.01337	0.006718	11.1
275	10	6	4	72	22	15.6	0.01337	0.003188	6.3
1440	9	6	3	72	22	15.8	0.01337	0.001401	4.8

<b>Sieve Analysis of Fine Aggregate</b>				
Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0	0.00	100
#4	4.75	0	0.00	100
#8	2.36	0	0.00	100
#10	2.00	0	0.00	100
#16	1.18	0.04	0.06	100
#30	0.60	0.24	0.38	100
#40	0.43	0.35	0.55	99
#50	0.30	0.54	0.85	99
#100	0.15	0.94	1.48	99
#200	0.075	2.52	3.96	96
pan		8.59	13.49	87





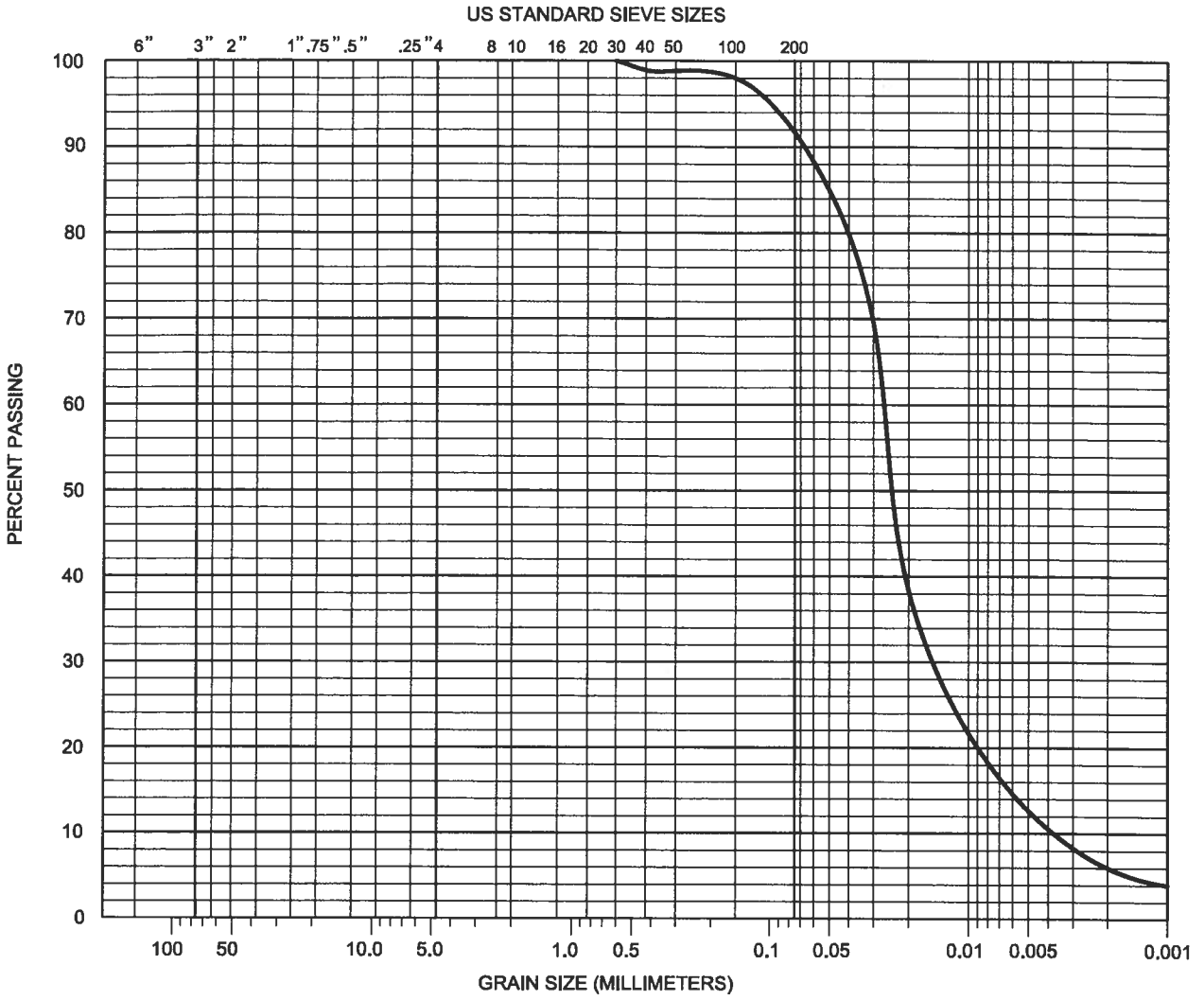
<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	NW4		

Weight Retained on the #10	0.2	0.17	Tare	15.87	g
Weight Passing the #10	123.03	99.83	Wet Weight + Tare	62.94	g
Total Wet Sample Weight	123.23		Dry Weight + Tare	62.00	g
Total Dry Sample Weight	120.77		Moisture Content	2.04	%

<b>Hydrometer</b>					
Air Dry Weight of Sample Used	58.68		Specific Gravity (assumed)	2.60	
Dry Weight of Sample Used	57.51	g	Specific Gravity Correction Factor	1.01	
Dry Weight Represented (W)	57.60	g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, F (%Soil Finer)
2	46	7	39	72	22	9.9	0.01337	0.029745	68.4
5	28	6	22	72	22	12.7	0.01337	0.021297	38.6
15	23	6	17	72	22	13.5	0.01337	0.012687	29.8
30	19	6	13	72	22	14.2	0.01337	0.009186	22.8
60	15	6	9	72	22	14.8	0.01337	0.006645	15.8
275	11	6	5	72	22	15.5	0.01337	0.003172	8.8
1440	9	6	3	72	22	15.8	0.01337	0.001401	5.3

Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0	0.00	100
#4	4.75	0	0.00	100
#8	2.36	0	0.00	100
#10	2.00	0	0.00	100
#16	1.18	0.00	0.00	100
#30	0.60	0.20	0.35	100
#40	0.43	0.36	0.62	99
#50	0.30	0.53	0.92	99
#100	0.15	0.93	1.61	98
#200	0.075	4.51	7.83	92
pan		15.01	26.06	74



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	SAMPLE LOCATION	FIELD MOISTURE (%)	% PASSING NO. 200 SIEVE	% PASSING 2 μ	UNIFIED SOIL CLASSIFICATION
	NW4	--	92.0	6	--

## GRADATION TEST RESULTS

PROJECT NO. 1643.1.1	KLEINFELDER LABORATORY TESTING	LAB NO. 07-266
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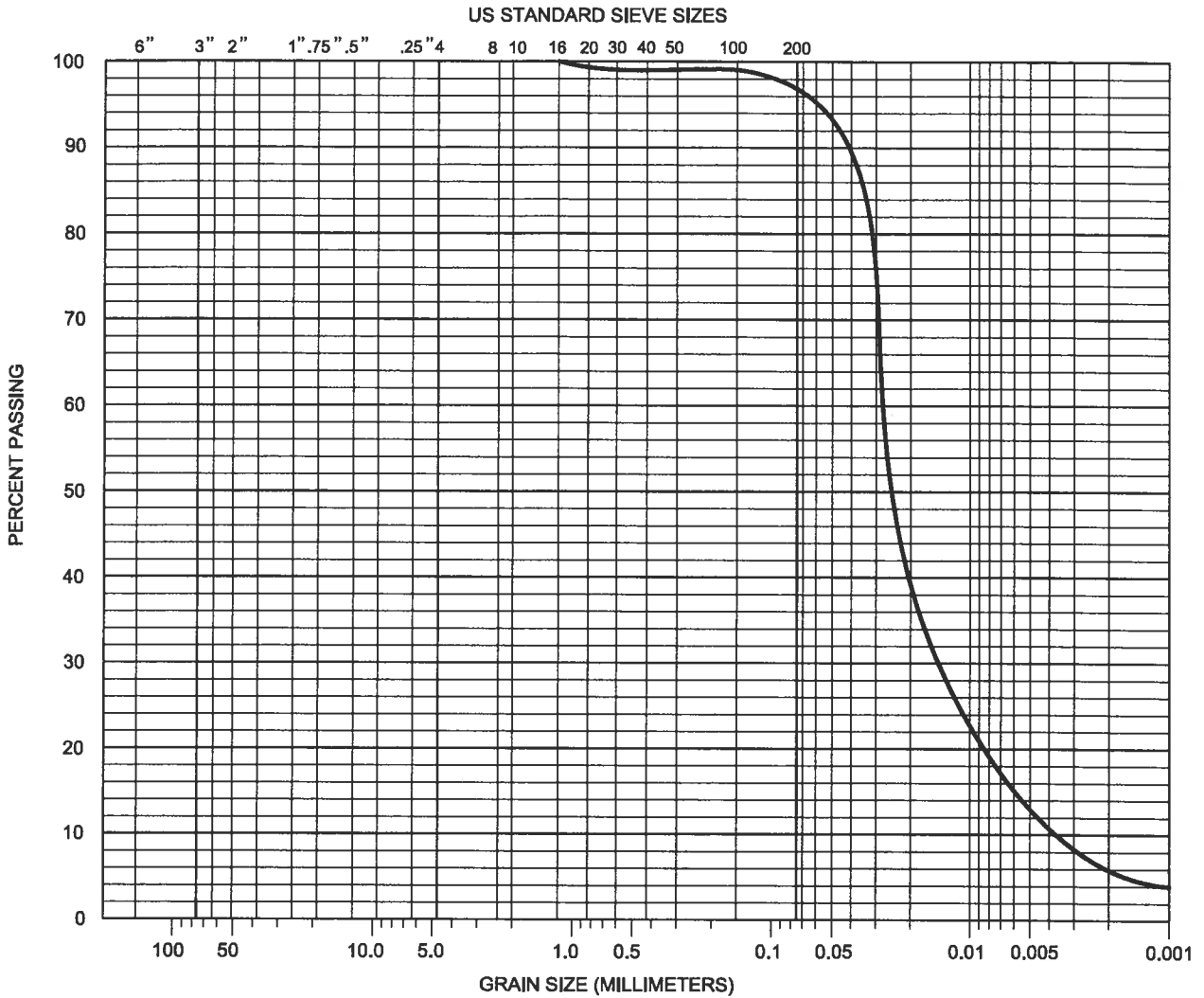
<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	NW5		

Weight Retained on the #10	0.7	0.42	Tare	13.47	g
Weight Passing the #10	169.44	99.58	Wet Weight + Tare	51.18	g
Total Wet Sample Weight	170.14		Dry Weight + Tare	50.53	g
Total Dry Sample Weight	167.21		Moisture Content	1.75	%

<b>Hydrometer</b>					
Air Dry Weight of Sample Used	66.04		Specific Gravity (assumed)	2.60	
Dry Weight of Sample Used	64.90	g	Specific Gravity Correction Factor	1.01	
Dry Weight Represented (W)	65.17	g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, F (%Soil Finer)
2	48	6	42	72	22	9.4	0.01337	0.028996	65.1
5	34	6	28	72	22	11.7	0.01337	0.020455	43.4
15	23	6	17	72	22	13.5	0.01337	0.012687	26.3
30	17	6	11	72	22	14.5	0.01337	0.009292	17.0
60	15	6	9	72	22	14.8	0.01337	0.006645	13.9
275	11	6	5	72	22	15.5	0.01337	0.003172	7.7
1440	9	6	3	72	22	15.8	0.01337	0.001401	4.6

<b>Sieve Analysis of Fine Aggregate</b>				
Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0.4	0.24	100
#4	4.75	0.6	0.36	100
#8	2.36	0.6	0.36	100
#10	2.00	0.7	0.42	100
#16	1.18	0.02	0.03	100
#30	0.60	0.08	0.12	99
#40	0.43	0.16	0.25	99
#50	0.30	0.21	0.32	99
#100	0.15	0.40	0.61	99
#200	0.075	1.76	2.70	97
pan		2.66	4.08	96



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	SAMPLE LOCATION	FIELD MOISTURE (%)	% PASSING NO. 200 SIEVE	% PASSING 2 $\mu$	UNIFIED SOIL CLASSIFICATION
	NW5	--	97.0	6	--

## GRADATION TEST RESULTS

PROJECT NO. 1643.1.1	KLEINFELDER LABORATORY TESTING	LAB NO. 07-266
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<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	NW6		

Weight Retained on the #10	0.05	0.11	Tare	13.49 g
Weight Passing the #10	46.92	99.89	Wet Weight + Tare	15.94 g
Total Wet Sample Weight	46.97		Dry Weight + Tare	15.88 g
Total Dry Sample Weight	45.82		Moisture Content	2.51 %

<b>Hydrometer</b>			
Air Dry Weight of Sample Used	30.01	Specific Gravity (assumed)	2.60
Dry Weight of Sample Used	29.28 g	Specific Gravity Correction Factor	1.01
Dry Weight Represented (W)	29.31 g		

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, P (%Soil Finer)
2	22	5	17	72	22	13.5	0.01337	0.034745	58.6
5	15	5	10	72	22	14.7	0.01337	0.022890	34.5
15	12	5	7	72	22	15.1	0.01337	0.013435	24.1
30	9	5	4	72	22	15.6	0.01337	0.009653	13.8
60	8	5	3	72	22	15.8	0.01337	0.006862	10.3
275	7	5	2	72	22	16.0	0.01337	0.003222	6.9
1440	6	5	1	72	22	16.1	0.01337	0.001415	3.4

Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0	0.00	100
#4	4.75	0	0.00	100
#8	2.36	0	0.00	100
#10	2.00	0	0.00	100
#16	1.18	0.00	0.00	100
#30	0.60	0.19	0.65	99
#40	0.43	0.29	0.99	99
#50	0.30	0.40	1.36	99
#100	0.15	0.59	2.01	98
#200	0.075	2.03	6.93	93
pan		3.30	11.26	89





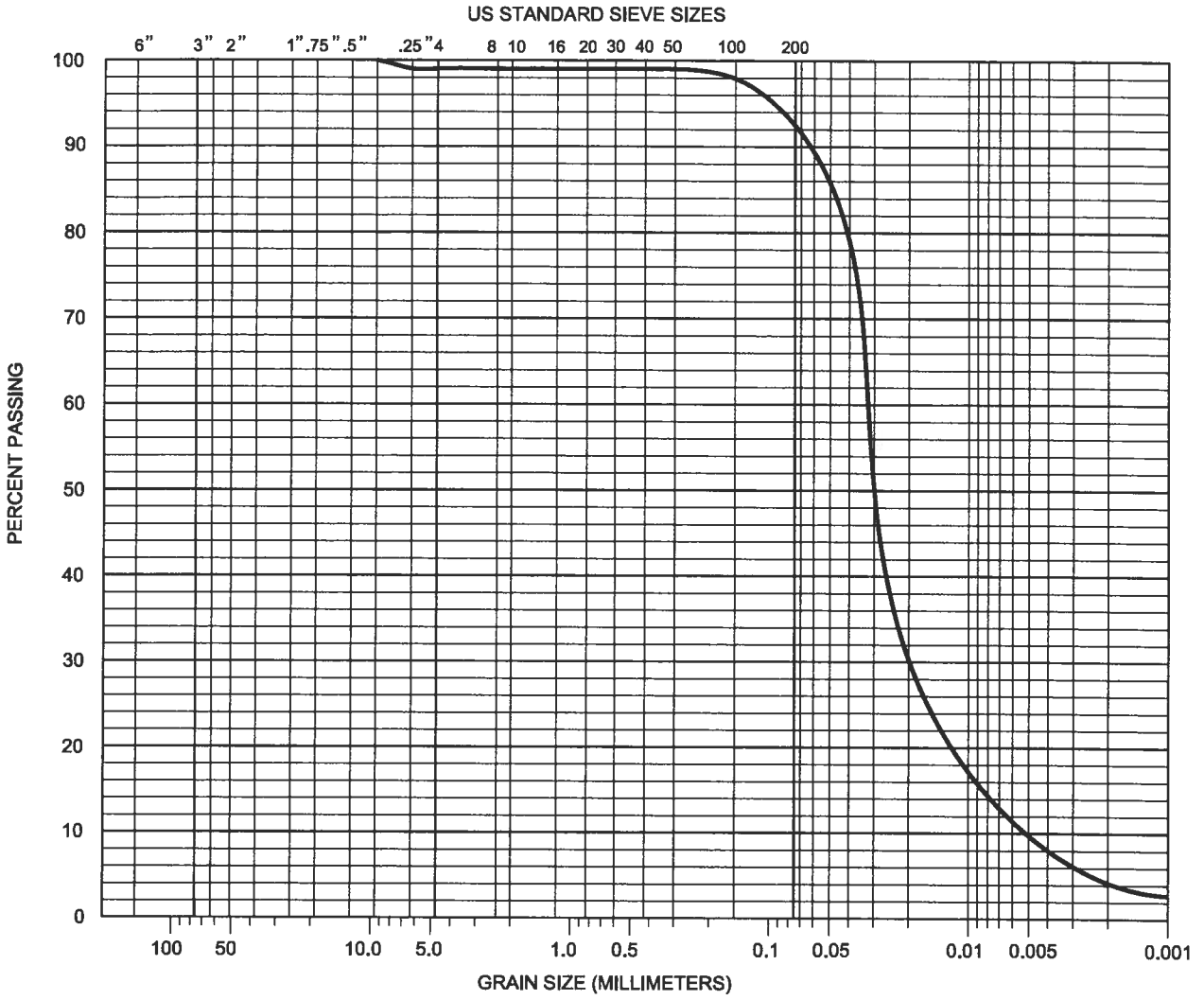
<b>Project Name</b>	Kleinfelder Conduit	<b>Project Number</b>	1643.1.1
<b>Laboratory Number</b>	07-266	<b>Date Tested</b>	07/31/07
<b>Sample Description</b>	NW7		

Weight Retained on the #10	1.04	0.75	Tare	13.56 g
Weight Passing the #10	140.62	99.25	Wet Weight + Tare	48.14 g
Total Wet Sample Weight	141.66		Dry Weight + Tare	47.39 g
Total Dry Sample Weight	138.59		Moisture Content	2.22 %

<b>Hydrometer</b>				
Air Dry Weight of Sample Used	52.32		Specific Gravity (assumed)	2.60
Dry Weight of Sample Used	51.19 g		Specific Gravity Correction Factor	1.01
Dry Weight Represented (W)	51.57 g			

Elapsed Time, T (min)	Actual Hydrometer Reading	Composite Correction	Hydrometer Reading with Composite Correction Applied, R	Temperature °F	Temperature °C	Effective Depth of Hydrometer L(cm)	Value of K	Diameter of Soil Particle D(mm)	Soil in Suspension, P (%Soil Finer)
2	34	6	28	72	22	11.7	0.01337	0.032342	54.8
5	24	6	18	72	22	13.3	0.01337	0.021841	35.3
15	16	6	10	72	22	14.7	0.01337	0.013215	19.6
30	14	6	8	72	22	15.0	0.01337	0.009449	15.7
60	12	6	6	72	22	15.3	0.01337	0.006754	11.8
275	9	6	3	72	22	15.8	0.01337	0.003205	5.9
1440	8	6	2	72	22	16.0	0.01337	0.001408	3.9

Sieve Size	Soil Diameter (mm)	Weight Retained	Percent Retained	Total Percent Passed
1 1/2"	37.5	0	0.00	100
1"	25	0	0.00	100
3/4"	19	0	0.00	100
1/2"	12.5	0	0.00	100
3/8"	9.5	0	0.00	100
1/4"	6.3	0.71	0.51	99
#4	4.75	0.71	0.51	99
#8	2.36	0.74	0.53	99
#10	2.00	1.03	0.74	99
#16	1.18	0.00	0.00	99
#30	0.60	0.11	0.21	99
#40	0.43	0.18	0.35	99
#50	0.30	0.25	0.48	99
#100	0.15	0.43	0.83	98
#200	0.075	3.38	6.55	93
pan		5.87	11.38	88



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	SAMPLE LOCATION	FIELD MOISTURE (%)	% PASSING NO. 200 SIEVE	% PASSING 2 μ	UNIFIED SOIL CLASSIFICATION
---	NW7	--	93.0	5	--

## GRADATION TEST RESULTS

PROJECT NO. 1643.1.1	KLEINFELDER LABORATORY TESTING	LAB NO. 07-266
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	mercury 8 oz	conventional 8 oz	grain size 12 oz	sieved Hg 12 oz	sulfide 2 oz	nitrate 1 liter	bioassay 1 liter	bioaccum 1 liter
NW1	1	1	1		1	2	3	1
NW2	1	1	1		1	2	3	1
NW3	1	1	1		1	2	3	1
NW4	1	1	1		1	2	3	1
NW5	1	1	1		1	2	3	1
NW6	1	1	1		1	2	3	1
NW7	1	1	1		1	2	3	1
L Buck	1		1	1				
Buck	1		1	1				
Mill	1		1	1				
Gilmer	1		1	2				
Rattlesnake	1		1	2				
Trout Lake	1		1	2				
Salt Creek	1		1	2				
WS+Col	1		1	1				7
LWS+Col	1		1	1				2-1
Wind+Col	1		1	1				
	17	7	17	10	7	14	21	14
	24	7	27	10	7	14	49	14

dx. 87 grain size  
2 dx. Hgds